

The true difference of level is 237 feet,* and the distance in a strait line twenty-four miles, the intervening country being rangy and timbered. The worst result by instrument No. 1, is 12 feet in error, the best 1 foot, and the mean 1·3 feet; by No. 2, the worst is 24·2 in error, the best 3·5, and the mean 4·6; by No. 3, the worst is 19·1 in error, the best 3, and the mean 7·4. The mean of the three means is 4·4 in error.

I also read the instruments at the various stations between Melbourne and Lilydale, and plotted the section of the line from the observations so made. The diagram submitted shows the result. I do not regard this as a fair test, as the readings were hurried, and the instruments had not time to settle. Still the result, especially with No. 3, the Watkin, is fairly consistent and good enough to be of very considerable practical utility.

I think the above experiments will serve as far as they go, to show that barometer work, carried out with fairly good instruments carefully used, and with all proper corrections applied, may be relied upon to give differences of level with greater accuracy than is often supposed, and with sufficient accuracy to be of very great service in preliminary investigations connected with engineering works of various descriptions.

ART. X.—*A New System of Photo-Lithography.*

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[Read June 13, 1869.]

* I have since been informed that this level is not quite accurate.